

AMENDED VERSION

IN THE SPECIFICATION:

CROSS REFERENCE TO RELATED APPLICATIONS

a
This application is a divisional of United States Patent Application Serial No. 09/045,223, filed March 20, 1998, which is incorporated herein by reference.

GOVERNMENT SUPPORT

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This invention was made government support under NIH Grant ES06629 and NIH Grant ES07471 awarded by the National Institute of Health and Army Contract Number DAMD17-97-C-7033 awarded by the Army. The government has certain rights in the invention.

IN THE CLAIMS:

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62. A method for manufacturing sensor fibers having identical surface chemistries and thus sensitivities to their target analytes, in which large quantifies of sensor fibers may be chemically sensitized together by using a carrier capable of holding a plurality of fiber and in which the carrier is filled with fiber sections:

(a) Cut from a longer length of multimode fiber having a high index core material such as and without limitation, fused silica, and covered with a low refractive index cladding material such as and without limitation amorphous copolymers of perfluoro (2,2-dimethyl-1,3 dioxole) and tetrafluoroethylene (e.g. Teflon AFTM; and

(b) The distal and proximal ends of said clad fiber sections are covered in a protective sheath means, such as and without limitation, polyimide plastic material, which is sufficiently inert to the solutions to be used in preparing the sensitized fibers and which is tightly sealed to said fiber cladding means by means such as and without limitation heat shrinking of sheathing tubes to the clad fibers, so as to prevent said solutions from touching the cladding means sealed beneath the protective sheaths, and which sheath means may be used for handling the fibers without damaging the sensitized fiber regions after all processing steps are completed.

63. The methods of claim 62 in which one or more carriers are used to convey a plurality of clad fiber sections, said fiber sections having protective sheathing means sealed to their proximal and distal ends through a series of sequential processing steps which include:

(a) Immersing said clad fiber surfaces in a series of cleaning and rinsing solution means to remove surface contamination, where said cleaning and rinsing solutions means may utilize ultrasonic transducers or other

forms of solution agitation both external to or internal to the carrier to enhance the ability of cleaning and rinsing solutions to remove surface contamination; and

(b) Drying said cleaned fibers to remove all traces of solutions used in cleaning; and

(c) Placing said cleaned fibers in an atmosphere which excludes reactive gaseous components such as but not limited to, water, vapor, which can interfere with subsequent chemical sensitization or processing steps; and

(d) Immersing said clad fiber surfaces in solvent means which dissolves and removes controlled amounts of said cladding material from the unsheathed sections of fiber without dissolving the cladding under the sheathed sections of fiber, where such cladding material may be but is not limited to amorphous copolymers of perfluoro (2,2-dimethyl-1,3 dioxole) and tetrafluoroethylene, e.g., Teflon AFTM and the solvent used for dissolving controlled amounts of this cladding material may compromise but is not limited to a mixture of perfluorinated alkanes, such as and without limitation the mixture known as FLUORINERT FC-75TM; and

(e) Dissolving or otherwise removing the cladding means surrounding the silica fiber surfaces of the unsheathed sections of said clad fibers except for a controlled residue of cladding means which provides a network of protective hydrophobic regions of cladding material interspersed with clean bare surface regions of said fiber core material; and

(f) Subsequently processing the fiber sections to sensitize them to the analyte to be measured, by the sequentially immersing said carrier in chemical and rinse solutions.

64. A means of protecting surfaces glass or silicon sensor surfaces with enhanced protection from the non-specific binding of protein to said surfaces by using a solvent such as but not limited to the mixture of perfluorinated alkanes, such as and without limitation known as FLUORINERT FC-75TM, to substantially remove all of a surface cladding means such as and without limitation to the amorphous copolymers of perfluoro (2,2-dimethyl-1,3 dioxole) and tetrafluoroethylene, known as Teflon AFTM, except for nearly undetectable trace amounts of contamination from constituents of said cladding which form an open network elevated regions surrounding the underlying clean, bare, glass or silicon surface regions.